

**Claim 1:** [Currently Amended] A method of repairing a rail, which rail includes head, upright web and base sections, said method comprising the steps of:

- a) identifying and locating a defect in the rail;
- b) removing the defect from the rail by removing the defect and material surrounding the defect, ~~in at least the head section~~ so as to form a void and a rail-void interface, while maintaining continuity of the base and at least a portion of the web of the rail;
- c) filling the void with molten metal; and
- d) causing the molten metal and the rail at the rail-void interface to bond.

**Claim 20.** [Currently Amended] A railroad rail head repair comprising a rail having a head, a base and a web interconnecting the head and base;

the head including a flaw;

a gap formed in a portion of the rail ~~head at~~;

said gap formed by slotting the rail so the base and at least a portion of the web remain continuous, said gap encompassing the location of the flaw, the said gap eliminating the flaw from the rail;

said gap extends at least through a portion of the head, and does not extend so far as to include the base;

a removable mold positioned on the rail, surrounding the gap;

a weld fill material having a high carbon content, approximating the carbon content of the rail, the weld fill material being melted to form molten metal, the molten metal positioned within and completely filling the gap, the molten metal permitted to cool, solidifying in ~~the said gap of the rail head.~~

**Claim 24:** [Currently Amended] A method of repairing a rail, which rail includes head, upright web and base sections, said method comprising the steps of:

a) identifying and locating a defect in the rail;  
b) removing the defect from the rail by removing the defect and material surrounding the defect, ~~in at least the head section~~ so as to form a void and a rail-void interface, while maintaining continuity of the base and at least a portion of the web of the rail;

c) filling the void with molten metal; and  
d) causing the molten metal and the rail at the rail-void interface to bond;

wherein the void is filled with molten metal by one of arc welding;

~~wherein the void is filled using~~ gas shielded arc welding and or

~~wherein the gas shielded arc welding is~~ inert gas arc welding;

said molten metal is formed from a material resulting in a weld deposit having a carbon concentration of about 0.2% to 1.0% by weight.